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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/720,409	11/24/2003	Feng Chen	CS 03-039	5057

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EXAMINER

SHAKERI, HADI

ART UNIT PAPER NUMBER

3723

DATE MAILED: 06/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary	Application No. 10/720,409	Applicant(s) CHEN ET AL.	
	Examiner Hadi Shakeri	Art Unit 3723	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 November 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>112403</u> . | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Drawings

1. Figures 2A-2C should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Applicant states on page 10 that these figures are not admitted to be prior art, yet on the same page it is disclosed that the present invention is an improvement and that groove 204 traps slurry particles or other debris 208 that cause the problems as discovered by the inventor, thus these rectangular grooves must be prior art for the Applicant to improve upon.

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the "groove having cross-sectional areas that change along the length of the groove" must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant

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will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 13-22 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 13, the language, i.e., "can further comprise" (lines 1 and 2) does not positively recite the elements claimed. Is Applicant claiming other channels and recesses and/or protrusions, or not?

5. Claim 14 recites the limitation "said groove" in line 4. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

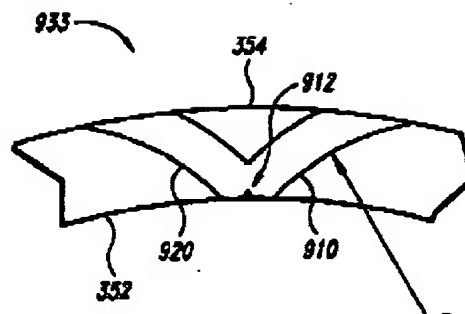
A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 1, 5, 7, 8, 10-15, 18 and 21 are rejected under 35 U.S.C. 102(e) as being anticipated by Taylor (6,869,335).

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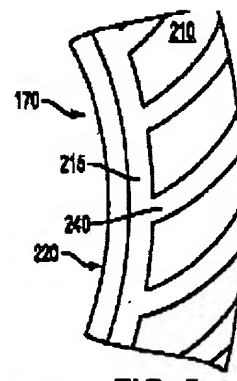
Taylor discloses all of the limitations of claims 1 and 14, i.e., a CMP retaining ring having at least one groove on a lower side of the ring extending from an inner to an outer periphery with at least one portion of the groove having a rounded contour or slanted contour (05:32-34).



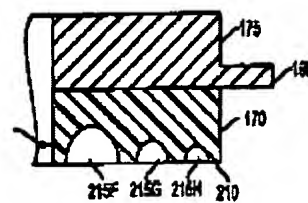
Regarding claims 5, 7, 8, 10-15, 18 and 21, Taylor meets the limitations, i.e., rounded top corner adjacent to a lower surface of the ring (contacting the pad); cross-section of groove changing along its length (e.g., Fig. 9); vertical side wall and an about horizontal bottom (e.g., Fig. 3B) with a rounded top corner; plurality of grooves; and wherein the CMP removes materials from a micro-device workpiece.

8. Claims 1, 2, 4-6, 8-10, 13-20 and 22 are rejected under 35 U.S.C. 102(e) as being anticipated by Kajiwara et al. (6,893,327).

Kajiwara et al. discloses all of the limitations of claims 1 and 14, i.e., a CMP retaining ring having at least one annular and radial groove on a lower side of the ring extending from an inner to an outer periphery with at least one portion of the annular groove having a rounded contour or slanted contour and further disclosing that radial grooves (240) have dimensions similar to those of annular recess (215) (11:5-10).



Regarding claims 2, 4-6, 8-10, 13-20 and 22, Kajiwara et al. meets the limitations, i.e., semicircular profile with radius (depth or width as defined by the instant application, e.g., Fig. 3C) of e.g., 5 mm;



rounded bottom corner adjacent to the bottom of the groove; cross-section of groove changing along its length (e.g., Fig. 8); vertical or sloped (e.g., Fig. 14); width of e.g., 5 mm and a depth of

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e.g., 5 mm (11:08-09); plurality of grooves; and wherein the CMP removes materials from a micro-device workpiece.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 2-4, 6, 9, 16, 17, 19, 20 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Taylor in view of Kajiwara et al.

Taylor as described in section 7 meets all of the limitations of the above claims, except for disclosing a semicircular profile for the grooves and the recited dimensions for the width and the depth.

Kajiwara et al. teaches grooves with semicircular profiles. It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to modify the invention of Taylor with semicircular profiles as taught by Kajiwara et al. to reduce the rebound effect (Kajiwara et al. 12:1-5).

Regarding claims 3, 6, 17, 19 and 20, Taylor as modified by Kajiwara et al. meets the limitations, e.g., semicircular profile with rounded top and bottom corners.

Regarding claims 3, 6, 17, 19 and 20, Taylor as modified by Kajiwara et al. meets the limitations, i.e., rounded top corner as disclosed by Taylor and rounded bottom corner as modified by Kajiwara et al.

Regarding claims 4, 9 and 22, Taylor discloses that the depth and the width of the groove may be changed to provide the desired flow characteristics (05:36-38). It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to modify the

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invention of Taylor with the depth and the width as taught by Kajiwara et al., e.g., 5 mm to achieve the desired characteristics.

11. Claims 3, 7, 11, 12 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kajiwara et al. in view of Taylor.

Kajiwara et al. as described in section 8 meets all of the limitations of the above claims, except for disclosing a rounded top corner (corner contacting the pad).

Taylor teaches the corners of the grooves contacting the pad can be beveled or rounded. It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to modify the invention of Kajiwara et al. with semicircular profiles as taught by Taylor to avoid excessive wear of to the pad (Taylor 05:32-34).

Regarding claims 3, 7 and 20, Kajiwara et al. as modified by Taylor meets the limitations, e.g., rounded top corner.

Regarding claims 11 and 12, Kajiwara et al. as modified by Taylor meets the limitations, i.e., rounded top corner for the embodiments of Fig. 10B.

Conclusion

12. Prior art made of record and not relied upon are considered pertinent to applicant's disclosure. Quek et al. and Kim are cited to show related inventions.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hadi Shakeri whose telephone number is (571) 272-4495. The examiner can normally be reached on Monday-Thursday.

The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read 'Hadi Shakeri', with a long horizontal flourish extending to the right.

Hadi Shakeri
Primary Examiner
Art Unit 3723
May 28, 2005